

SCAN RAPE IN AUTUMN – CLEVERLY FERTILISE IN SPRING

Bodo Hanns, Agri Con GmbH · Jahna

“You reap what you sow” is the saying and there’s plenty of truth in that. Equally important is specific plant nutrition. There is a lot of guidance available for determining the optimal amount of the initial N-application in spring. In addition to the classical applications a new measure has become established – an assessment of the crop in autumn using Sensorscan. Then the farmer already knows in autumn where the emphases lie and can plan the fertilisation and plant protection measures appropriately.

Fertilising using sensor technology

The YARA N-Sensor is an optical measuring system. Mounted on the roof of the carrier vehicle, it measures the current N-uptake, i.e. how much nitrogen the plants have absorbed from the fertiliser at that point. The optimum N-fertiliser amount is then calculated from the values. This is done by the farmer using crop-specific control functions and user-specific specifications. The calculated fertiliser recommendation is finally transferred to the fertilisation technology and immediately applied to the specific area. This has

been an established method for online fertilisation in spring of cereals, rape, maize and potatoes for many years.

Combining sensor fertilisation with maps

Scientific tests show: Optimum N-fertilisation in spring is directly dependent on the N-uptake by the rape before the previous winter. The higher the N-uptake in autumn, the lower the N-fertilisation needs to be in spring, and vice versa. Therefore, N-sensor users are increasingly combining online fertilisation with a Sensorscan of the crop

in autumn, with subsequent calculation of N-fertilisation maps.

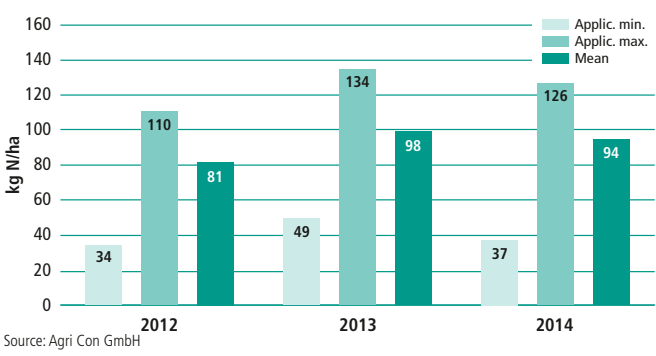
The autumn scan takes place either individually or during the final plant measure. The results are N-uptake maps covering the whole area for all the scanned fields. On the basis of this, farmers, agricultural advisers or other service providers are able to create appropriate fertilisation maps for the first N-application in spring. This can be done using the web application “Agriport”. The user simply enters the following relevant information:

Tab. 1: Average heterogeneity of rape crops in autumn 2012–2014

Field area	Number of fields			Area (ha)			N-uptake								
							min (kg N/ha)			max (kg N/ha)			mean (kg N/ha)		
	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
<10 ha	92	414	692	395	2,045	3,637	43	46	44	101	112	117	58	84	90
10–20 ha	40	216	377	581	3,091	5,519	35	39	36	102	116	122	67	83	90
20–30 ha	23	118	211	544	2,851	5,162	24	31	30	97	118	118	73	84	87
30–40 ha	14	61	129	487	2,075	4,428	26	37	25	107	130	122	81	91	87
>40 ha	39	187	309	3,155	13,141	19,969	28	27	23	113	127	124	85	84	88
Total/mean	208	996	1,718	5,162	23,203	38,969	35	39	35	103	118	120	68	84	89



Fig. 1: Autumn N-uptake rape 2012–2014



take of 81 kg N/ha (Fig. 1).

Large differences were also seen within the measured fields. The heterogeneity is therefore only dependent on the field size to a certain extent. A comparison of field sizes < 10 ha and > 40 ha shows that the differences also increase with increasing field size. However, large differences in N-uptake were also seen in sections in small fields. These differences were also recorded in the years 2012 and 2013 (see Tab. 1). Therefore, it can be expected that this extent of difference is normal within rape crops.

- target value of N-uptake
- average dead biomass and
- minimum/maximum fertilisation amount

and the N-fertilisation maps are generated automatically. When the first N-application is due, this is loaded into the terminal and processed automatically.

The following agronomical principle applies during the calculation: crops with higher N-uptake receive less nitrogen; crops with lower N-uptake are fertilised with correspondingly more nitrogen in autumn. With this fertilisation strategy, the initial N-application aims to achieve a target value of 160 kg N/ha. This results from the N-uptake of the rape crop in autumn and the mineral N-fertilisation. Where there are differences in the N-uptake of 30 to 140 kg/ha, the N-fertilisation can vary within a field by between 20 and 130 kg N/ha.

The expected yield is unimportant initially. The N-application is adjusted to the expected yield during the second N-fertilisation.

Results autumn 2014

In 2014 during a nationwide autumn scanning using the YARA N-Sensor, 39,000 hectares of rape were recorded. Measurements were performed from mid-October to end-November. In the process the average N-uptake of 94 kg/ha was determined; in general values from 50 to 80 kg N-uptake/ha are aimed for, with which the rape should go into winter.

Compared with the previous year, the 2014 crops achieved similar values. In contrast, the year 2012 appeared considerably weaker with a mean N-up-

Comparison of N-uptake according to field size

Field area	Number of fields	Area (ha)	N-uptake		
			min (kg N/ha)	max (kg N/ha)	mean (kg N/ha)
< 10 ha	692	3,637	44	117	90
> 40 ha	309	19,969	23	124	88
Mean	1,001	23,606	35	120	89



Effects

In long-term large-scale trials using the “on farm research principle” it was demonstrated that targeted N-application alone led to higher yields and an improved N-balance. In the last six years, farmers were able to realise on average 5 % more yield in rape with 8 % lower N-application with the aid of the YARA N-Sensor. With an average 2.7 dt/ha additional yield and a rape price of 35 €/dt, this corresponds to a monetary advantage of 92 €/ha. The N-balance was improved on average by 21 kg N/ha.

Bodo Hanns

Phone +49 34324 525 312
Fax +49 34324 524 400
bodo.hanns@agrimon.de

